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Appl. No. 10/801,475
Reply to Office Action of August 28, 2006

Attorney Docket No. 2003-1410 / 24061.193
Customer No. 42717

REMARKS

Claims 15-18 have been canceled, and Claims 2, 7-10 and 13 have been amended. Claims 1-14 and 19-20 are presented for examination. In view of the foregoing amendments, and the remarks that follow, Applicants respectfully request reconsideration.

Allowable Subject Matter

Noted with appreciation is the indication in the Office Action that dependent Claim 14 recites allowable subject matter, and would be allowed if rewritten in independent form. Claim 14 depends indirectly from independent Claim 1, and Claim 1 is believed to be allowable for reasons discussed below. Accordingly, it is believed to be unnecessary to separately place Claim 14 in independent form at this time.

Non-Elected Claims

Claims 15-18 were withdrawn from consideration on the merits pursuant to a previous restriction requirement, and have therefore been canceled. Applicants reserve the right to eventually file a divisional application that presents the subject matter of non-elected Claims 15-18 for examination on the merits.

Election-of-Species Requirement

In the most recent prior Office Action (mailed January 13, 2006), the Examiner set forth an election-of-species requirement. As discussed in an Interview Summary paper filed by Applicants on June 27, 2006, the undersigned discussed the January 13 election-of-species requirement with the Examiner, and also with the Supervisory Primary Examiner (SPE). The SPE agreed that the January 13 election-of-species requirement was not proper, and withdrew it.

In the present Office Action, the Examiner presents a slightly modified version of the January 13 election-of-species requirement, and asserts that Applicants' arguments regarding the

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January 13 requirement were not persuasive and that the requirement has therefore been made "final". However, this is not correct because Applicants' arguments were in fact persuasive and caused the SPE to withdraw the January 13 election-of-species requirement. Consequently, the election-of-species requirement in the present Office must necessarily be a new and different election-of-species requirement, and therefore cannot possibly be at a stage where the Examiner can properly make it a "final" requirement. The undersigned was not able to reach Examiner Lewis by telephone, and therefore discussed this problem with SPE Zandra Smith by telephone on October 3 and October 17, 2006. SPE Smith indicated that she was withdrawing the "finality" of the election-of-species requirement in the present Office Action.

Applicants respectfully traverse the new election-of-species requirement in the present Office Action. First, MPEP §806.04(e) specifies that "*Claims are never species . . . Species are always the specifically different embodiments*". Accordingly, the references to specific claims in the election-of-species requirement are not proper and should not be present, and are therefore being ignored by Applicants. Considering the remainder of the election-of-species requirement, it identifies the following two species:

Embodiment I - Figure 3.

Embodiment II - Figure 2.

However, this approach is respectfully traversed because it is not complete. For example, the present application discloses at least five different species that are encompassed by the pending claims, including (1) Figures 2 and 7A-7D, (2) Figure 3, (3) Figure 4, (4) Figure 5, and (5) Figure 6. The election-of-species requirement is structured in a manner so that Applicants do not have the option of electing the species of Figure 4, the species of Figure 5, or the species of Figure 6. However, the Examiner does not have the right to structure an election-of-species requirement in a manner so that it is impossible for Applicants to elect certain disclosed species that are encompassed by the claims. The present election-of-species requirement is therefore incomplete and defective, and it is respectfully submitted that it must be withdrawn.

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The PTO requires Applicants to reply to an election-of-species requirement, even where (as here) the requirement is defective and Applicants offer a valid traverse. Accordingly, as between the two species identified by the Examiner, Applicants elect under protest the species of Figure 3 (Embodiment I). The Office Action concedes that Claims 1-14 read onto the species of Figure 3, and Applicants respectfully submit that Claims 19-20 also read onto the species of Figure 3. Further, there are pending claims that are generic to each of the various different species shown in Figures 2 and 7A-7D, Figure 3, Figure 4, Figure 5 and Figure 6, including at least independent Claims 1 and 19.

Applicants also wish to offer a comment about the Examiner's statement on page 3 of the Office Action that Applicants should:

**note a proper response to a genus/species restriction is the
submission of evidence or the identification of such evidence
showing the species to be obvious variants or clearly admit on
the record that this is the case.**

This statement relates to a genus/species restriction requirement, rather than an election-of-species requirement. Thus, it has no apparent relevance to the election-of-species requirement set forth in the present Office Action.

Finally, the Examiner's attention is directed to the provisions of MPEP §803 and MPEP §808.02. In particular, MPEP §803 specifies that:

If the search and examination of all the claims in an application can be made without serious burden, the examiner must examine them on the merits, even though they include claims to independent or distinct inventions. (Emphasis added).

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Similarly, MPEP §808.02 specifies that:

Where . . . the classification is the same and the field of search is the same and there is no clear indication of separate future classification and field of search, no reasons exist for dividing among independent or related inventions.

In the present application, the Examiner has previously admitted that currently-pending Claims 1-14 and 19-20 are all classified in the same class and subclass, namely class 257, subclass 734. (See lines 5-6 on page 2 of the prior Office Action dated September 12, 2005). Accordingly, even assuming that the Examiner eventually manages to put together an election or restriction requirement that would otherwise be proper, the Examiner would still be required by PTO policy to examine all of pending Claims 1-14 and 19-20.

Objection to Incomplete Office Action

As discussed above, the election-of-species requirement in the present Office Action is incomplete and defective, because it identifies only two of the five or more disclosed species that are encompassed by the pending claims. Accordingly, in the absence of any proper basis for withdrawing Claims 19-20 from examination the merits, Applicants were entitled to have Claims 19-20 considered on the merits in the present Office Action. To the extent that the present Office Action fails to consider Claims 19-20 on the merits, the Office Action is not complete.

In addition, as also discussed above, the present election-of-species requirement is necessarily a new election-of-species requirement, and was not previously presented to Applicants in writing or by telephone. Applicants therefore have not made any provisional election under this new election-of-species requirement. Accordingly, the Examiner was not entitled to arbitrarily select Claims 1-14 for consideration on the merits while ignoring

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Claims 19-20, all without any input from Applicants. This is a further reason why the Office Action is rendered incomplete by the failure to consider Claims 19-20 on the merits.

For each of these reasons, the present Office Action is not complete, and it is respectfully submitted that the Office Action must be withdrawn, and that the Examiner must issue a new and non-final Office Action that is properly complete. In order to expedite examination of this application, the remarks below address other issues raised in the Office Action. However, this is not a waiver of Applicants' objection to the fact that the Office Action is not complete.

Title of the Invention

The Office Action objected to the title of the invention, asserting that it is not descriptive of the claimed subject matter. Applicants respectfully object to the fact that the Office Action fails to specify precisely why the Examiner is objecting to the title. As best understood, the pending claims now recite only an apparatus and not a method. Accordingly the foregoing amendments change the title to refer to an apparatus but not a method. It is respectfully submitted that the amended title is properly descriptive of the claimed subject matter. However, if the Examiner is still of the opinion that the title is not sufficiently descriptive, the Examiner is respectfully requested to (1) specify in detail why the amended title is believed to be problematic, and (2) propose a title that would be considered properly descriptive.

Absence of a Summary Section

The Office Action objects to the specification, on the ground that the specification does not include a "summary of the invention" section. This ground of objection is respectfully traversed. There is no requirement for a "summary of the invention" in the patent statute, the rules, or the MPEP. The applicable statutory section (35 U.S.C. §112, first paragraph) requires only that the specification include a written description that is enabling and that discloses Applicants' best mode of practicing the invention. No mention is made in §112 of any requirement for a summary. Although a summary is mentioned in MPEP §608.01(a) as part of a

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"preferred" style for the specification, it is clearly permissive rather than required. MPEP §608.01(a) even indicates that it is permissible for Applicants to optionally include a sub-heading such as "Brief Summary of the Invention", followed by the words "Not Applicable" and no other text. For these reasons, it is respectfully submitted that the Examiner's objection to the absence of a summary section is without basis, and must be withdrawn.

Antecedent Basis in the Specification for Claimed Subject Matter

The Office Action objects to the specification as failing to provide a proper antecedent basis for certain claimed subject matter, in particular the recitations of metallurgy layers that are thermally coupled. Applicants respectfully disagree. The specification makes it very clear that the disclosed dummy structures are configured to dissipate heat and, for example, paragraph [0022] explains how various dummy structures in each of two metallurgy layers are coupled to respective seal rings, and how the seal rings are coupled by vias. Applicants believe that persons skilled in the art will readily understand that paragraph [0022] is discussing dummy structures in respective metallurgy layers that are thermally coupled. Nevertheless, to expedite examination of this application, the foregoing amendments modify paragraph [0022] so it even more clearly states that dummy structures in two metallurgy layers are thermally coupled. These modifications merely state explicitly what was already at least inherent in the disclosed structure. It is respectfully requested that the objection to the specification be withdrawn.

Subject Matter Shown in the Drawings

The Office Action objects to the drawings under 37 C.F.R. §1.83(a), asserting that the drawings fail to show dummy structures that have different shapes and/or different sizes. This objection is respectfully traversed. As one example, Figure 3 shows dummy structures 44 that have different sizes and different shapes. It is therefore respectfully submitted that the objection to the drawings is without basis and must be withdrawn.

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Compliance with Second Paragraph of 35 U.S.C. §112.

The Office Action rejected Claims 1-14 under the second paragraph of 35 U.S.C. §112. In particular, the Office Action asserts that references to "two dummy structures" and "at least two" of the dummy structures are indefinite, because independent Claim 1 recites that there are one or more dummy structures.

As to Claim 1, the reference to "at least two" of the dummy structures, when taken in context, is a reference to one dummy structure in one metallurgy layer and another dummy structure in another metallurgy layer. Claim 1 clearly recites that each metallurgy layer includes at least one dummy structure, such that Claim 1 is necessarily reciting at least two dummy structures that are in respective different metallurgy layers. Consequently, there is nothing even remotely indefinite about the reference in Claim 1 to "at least two" of the recited dummy structures that are in different metallurgy layers.

As to other claims, the Examiner focuses on the word "one" in the recitation of "one or more" dummy structures in Claim 1. Applicants respectfully submit that, for purposes of the references in dependent claims to "two dummy structures" or "at least two" of the dummy structures, the Examiner should have focused on the words "or more" in the recitation of "one or more" dummy structures in Claim 1. Nevertheless, in order to expedite examination, the foregoing claim amendments adjust the language in some of the dependent claims, so that they are now even more consistent with the language in Claim 1. These modifications do not alter the intended scope of any of the dependent claims. It is respectfully submitted that the pending claims are all in proper compliance with §112.

Independent Claim 1 - 35 U.S.C. §103

Independent Claim 1 stands rejected under 35 U.S.C. §103 on the ground that it would be obvious in view of a proposed combination of teachings from Lee U.S. Patent No. 5,905,289 and Tomita U.S. Patent Application Publication No. 2005/0035457. This ground of rejection is respectfully traversed. The PTO specifies in MPEP §2142 that:

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The examiner bears the initial burden of factually supporting any *prima facie* conclusion of obviousness. If the examiner does not produce a *prima facie* case, the applicant is under no obligation to submit evidence of nonobviousness.

Applicants respectfully submit that Lee and Tomita fail to establish a *prima facie* case of obviousness under §103 with respect to Claim 1, for mutually exclusive reasons that are discussed below.

NONANALOGOUS ART CANNOT BE USED TO ESTABLISH OBVIOUSNESS

Only analogous prior art can be considered for the purpose of trying to establish a *prima facie* case of obviousness under 35 U.S.C. §103. In this regard, MPEP §2141.01(a) specifies that, for a reference to be "analogous" prior art that can be considered under §103, it must be either (1) in the field of Applicants' endeavor or (2) reasonably pertinent to the particular problem with which the inventor was concerned. The provisions of §2141.01(a) go on to explain that, although the PTO classification system carries a small amount of weight in determining what is relevant, similarities and differences in structure and function carry far greater weight. In this regard, §2141.01(a) discusses a specific example, and states that:

The court also found the reference was not reasonably pertinent to the problem with which the inventor was concerned because a person having ordinary skill in the art would not reasonably have expected to solve the problem of dead volume in tanks for refined petroleum by considering a reference dealing with plugging underground formation anomalies.

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In the present situation, and as evident from the title of the invention, the particular problem with which the Applicants were concerned, and the field of Applicants' endeavor, is heat dissipation within an integrated circuit. The Office Action admits at lines 1-2 on page 8 that Lee "fails to disclose . . . dummy structures from different metallurgy layers are thermally connected". Applicants agree, in part because words such as "heat" and "thermal" do not appear anywhere within Lee, much less in association with dummy structures. The Office Action then turns to Tomita. However, as explained in paragraph [0008], Tomita's focus is (1) inhibiting the occurrence of resist poisoning and (2) providing protection against external electromagnetic noise. But like Lee, words such as "heat" and "thermal" do not appear anywhere within Tomita, much less in association with dummy structures. Consequently, Tomita is no more relevant than Lee, and adds nothing to the teachings of Lee.

As mentioned above, the particular problem with which the Applicants were concerned, and thus the field of Applicants' endeavor, is heat dissipation within an integrated circuit. Neither Lee nor Tomita has any teachings about heat dissipation. Accordingly, neither Lee nor Tomita is within Applicants' field of endeavor, and neither is reasonably pertinent to the particular problem with which the inventors were concerned. In the words of the MPEP, neither Lee nor Tomita is "reasonably pertinent to the problem with which the inventor was concerned because a person having ordinary skill in the art would not reasonably have expected to solve the problem of" heat dissipation within an integrated circuit "by considering a reference dealing with" maintaining surface planarity of a metallurgy layer (lines 34-38 in column 2 of Lee), or inhibiting resist poisoning and providing protection against external noise (paragraph [0008] of Tomita). Accordingly, it is respectfully submitted that neither Lee nor Tomita is what the PTO considers to be "analogous" prior art. Thus, neither can properly be used in an attempt to establish a prima facie case of obviousness under §103. Consequently, the Examiner's burden of factually supporting a prima facie case of obviousness has clearly not been met, and the rejection under §103 should be withdrawn. For this reason alone, it is respectfully submitted that the pending §103 rejection must be withdrawn, and notice to that effect is respectfully requested.

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THERE IS NO REASONABLE EXPECTATION OF SUCCESS

MPEP §2142 sets forth certain minimum requirements that must be met in order to properly establish a prima facie case of obviousness, including a statement that:

To establish a *prima facie* case of obviousness, . . . there must be a reasonable expectation of success. . . . The . . . reasonable expectation of success must . . . be found in the prior art, and not based on applicant's disclosure.

In the present application, as discussed above, neither Lee nor Tomita has any teachings about how to effect heat dissipation. In fact, neither reference contains any occurrence of words like "heat" or "thermal". Consequently, if a person skilled in the art was attempting to improve heat dissipation in an integrated circuit, the person would have no reasonable expectation that combining Lee and Tomita would provide any level of success in achieving improved heat dissipation. Even though MPEP §2142 expressly indicates that the Examiner must demonstrate a reasonable expectation of success, the present Office Action fails to do so. In fact, to the extent that the Office Action is completely silent regarding expectation of success, the Office Action fails to meet the minimum requirements set forth in MPEP §2142 for establishing a prima facie case of obviousness.

The only possible reason that the Examiner might believe there is a reasonable likelihood of success is that the Examiner is relying on hindsight of the success taught in Applicants' disclosure. However, MPEP §2142 makes it very clear that hindsight of Applicant's disclosure cannot be used under §103. Accordingly, for this independent reason alone, it is respectfully submitted that Claim 1 is not rendered obvious under §103 by Lee and Tomita, and notice to that effect is respectfully requested.

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THERE IS NO MOTIVATION TO COMBINE LEE AND TOMITA

In setting forth the minimum requirements needed to establish a prima facie case of obviousness under §103, MPEP §2142 also specifies that:

To establish a *prima facie* case of obviousness, . . . there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. . . . The teaching or suggestion to make the claimed combination . . . must . . . be found in the prior art, and not based on applicant's disclosure.

As discussed above, neither Lee nor Tomita has any teachings about how to effect heat dissipation in an integrated circuit. In fact, neither contains any occurrence of words like "heat" or "thermal". Consequently, if a person skilled in the art was attempting to improve heat dissipation in an integrated circuit, neither Lee nor Tomita would motivate the person to combine Lee and Tomita. The motivation for combining teachings from Lee and Tomita is not coming from Lee or Tomita, but is necessarily coming from hindsight of Applicant's disclosure. In particular, using Applicant's disclosure as a blueprint, the Examiner has selectively extracted isolated structural features from Lee and from Tomita, and has then combined these isolated structural features with a 20/20 view of the desired result that is taught by Applicants. In regard to hindsight, examiners often attempt to justify the use of hindsight by turning to PTO Form Paragraph 7.37.03, which states that "any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning". However, this form paragraph does not apply in the present situation. In particular, this form paragraph goes on to emphasize that hindsight is permissible only to the extent that it "does not include knowledge gleaned only from the applicant's disclosure" (emphasis added). Here, Lee and Tomita cannot possibly render the

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subject matter of Claim 1 obvious, unless the analysis also includes hindsight of Applicant's disclosure. But MPEP §2142 and Form Paragraph 7.37.03 both make it very clear that hindsight of Applicant's disclosure cannot be used under §103. Accordingly, for this independent reason alone, it is respectfully submitted that Claim 1 is not rendered obvious under §103 by Lee and Tomita, and notice to that effect is respectfully requested.

In view of each of the various different reasons discussed above, it is respectfully submitted that Claim 1 is not rendered obvious under §103 by Lee and Tomita. Claim 1 is therefore believed to be allowable, and notice to that effect is respectfully requested.

Dependent Claims

Claims 2-13 each depend directly or indirectly from independent Claim 1, and are also believed to be distinct from the art of record, for example for the same reasons discussed above with respect to Claim 1.

Claims 19 and 20

As discussed earlier, Claims 19 and 20 were entitled to be examined on the merits, but the Office Action improperly failed to do so. As a result, Claims 19 and 20 are not currently subject to any ground of rejection. In the absence of any ground of rejection, Claims 19 and 20 are believed to be allowable, and notice to that effect is respectfully requested.

Conclusion

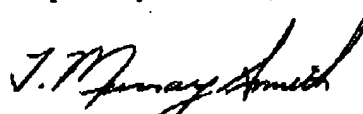
Based on the foregoing, it is respectfully submitted that all of the pending claims are fully allowable, and favorable reconsideration of this application is therefore respectfully requested. If the Examiner believes that examination of the present application may be advanced in any way by a telephone conference, the Examiner is invited to telephone the undersigned attorney at 972-739-8647.

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Although Applicants believe that no additional fees are due, the Commissioner is hereby authorized to charge any fee required by this paper, or to credit any overpayment, to Deposit Account No. 08-1394 of Haynes and Boone, LLP.

Respectfully submitted,



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Date: October 20, 2006

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Enclosures: None

R-149063.1